

# Risk Associated With The Clean Air Act NESHAP Standard

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From Preamble to the Rule: 40 CFR, Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities.

## Maximum Individual Risk (MIR)

[The maximum additional chance of contracting a fatal cancer for any person due to exposure to the emitted pollutant for a 70 year lifetime. The MIR is the risk to the Maximally Exposed Individual (MEI), i.e. that person living for 70 years in an offsite location that results in the greatest exposure to the emitted pollutant. For the purposes of demonstrating compliance with the Clean Air Act NESHAP, the doses are modeled to the nearest off-site residence, home, business or office.]

## Risk Associated With the Clean Air Act NESHAP Standard

The risk associated with the 10 millirem / year standard is  $2.8 \times 10^{-4}$ . The determination of compliance is through the use of the computer model CAP88-PC. CAP88-PC assumes that the person will live at the receptor location for 70 years. Since the receptor location is Lawrence Hall of Science, at which people work but do not reside, the exposure duration will be less and therefore the risk will be less than that implied from the model even at computed doses of 10 millirem. Additionally, if dose was modeled to the MEI one year at 10 millirem but less for other years, risk to the MEI would still be far lower than  $2.8 \times 10^{-4}$ . In fact, doses modeled to the MEI at Lawrence Hall of Science and confirmed by over 2 years of split sampling, indicate that the doses are a fraction of the standard and hence the risks to the MEI are a fraction  $2.8 \times 10^{-4}$ .

The NESHAP provides an alternate to computer modeling as a means of demonstrating compliance with the 10 millirem standard. Air concentrations for various radionuclides are provided within the rule. Measuring annual average air concentrations below these values would demonstrate compliance. The annual average air concentration for tritium is 1,500 picocuries / cubic meter (pCi/m<sup>3</sup>). It is important to keep in mind that the measured annual average must be below 1,500 pCi/m<sup>3</sup> to demonstrate compliance. Individual measurements may exceed this value yet not violate the standard. The highest air concentration measured between October 1997 and December 1999 was 145.3 pCi/m<sup>3</sup> with most measurements far below that.

The air concentration of 1,500 pCi/m<sup>3</sup> was selected to provide a convenient alternative to modeling. It is not equivalent to the  $2.8 \times 10^{-4}$  risk; it is more protective. One should not try to determine risk values simply by dividing the air concentration by the same fraction as the modeled dose to obtain a risk value.